



2010 Solar Market Transformation Analysis and Tools

This document describes the DOE-funded solar market transformation analysis and tools under development in Fiscal Year 2010 so that stakeholders can access available resources and get engaged where interested.

April 2010

Market Transformation
Solar Energy Technologies Program
U.S. Department of Energy

Project Topics

Solar America Cities Crosscutting Projects

- PACE Financing
- Financial Calculator for Solar on Public Buildings
- PV Cost Convergence Model
- Solar Rooftop Optimization Tool
- Solar Ready Building Practices
- Structural Design & Permitting for Solar Systems
- Economic Development Study
- Community Solar
- Solar Applications for Emergency Preparedness
- Solar and Historic Preservation
- Solar America Cities Metrics
- SunCity Planning Model

Workforce Development

- Downstream Solar Labor Market Analysis
- PV JEDI (Jobs & Economic Development Impacts) Model 2.0
- Solar Workforce Scale-up:
Lessons from Other Countries and Industries
- Inventory of Solar Licensing Requirements
- Renewable Energy Training Best Practices
& Recommended Guidelines

Solar Project and Policy Analysis Tools

- Utility Rate Open Platform Database Development
- Open PV Mapping Project
- Open PV: Visualization/Exploration Series
- Open PV: Breakeven Scenario Forecasting Tool
- Solar Project Analysis Tool Improvements/Dissemination
- Solar Project How-To Manual for Federal Sites
- Renewable Energy Project Finance WebView
- Feed-in Tariff Collaborative

Solar America Board for Codes and Standards (Solar ABCs)

- Flammability Testing of Standard Roofing Products
in the Presence of Standoff mounted PV Modules
- Potential Impact of Advanced Metering Infrastructure
on Renewable Energy Policy
- High Wind Loads and Model Code for PV Arrays
- Accelerated Lifetime Testing Background Research and Protocol
- PV Module Power Rating
- Understanding the Cal Fire Photovoltaic Installation Guidelines
- State Policy Options for Valuing Distributed PV Generation
- Rate Impact of Net Metering
- Review of FERC's Interconnection Screens
- PV Module Frame Grounding
- Inverter Meter Standard

Solar America Cities Crosscutting Project

PACE Financing

PROJECT LEAD:

Jason Coughlin, NRELjason.coughlin@nrel.gov

**Project lead is coordinating with DOE PACE Working Group to ensure complementary efforts between DOE, LBNL, NREL, NRDC, and VoteSolar, among others.*

Project Purpose

Provide updated information on key topics related to PACE Financing to inform policy-making and federal investment; catalogue the efforts of 3 cities developing PACE programs under the SAC Special Project awards.

Deliverables

- 3 Case Studies of Milwaukee, New Orleans, and San Jose PACE efforts
- PACE PowerPoint designed to educate local governments
- 3 White Papers:
 - 1) Impact of PACE lien on real estate transaction,
 - 2) Impacts of including PV in a PACE Program, and
 - 3) Economic Impacts of the Boulder County PACE program.

Timeline

Dec. 2009	Complete PACE PowerPoint and post to SAC Website
March 2010	White Papers #1-2 Complete
April 2010	PACE Session at SAC Annual Meeting
June 2010	PACE Session at DOE-sponsored Solar Boot Camp
Sept. 2010	Case Studies complete, White Paper #3 complete

Solar America Cities Crosscutting Project

Financial Calculator for Solar on Public Buildings

PROJECT LEAD:

Marissa D Reno, SNLmdreno@sandia.gov

Project Purpose

Provide cities pursuing public installations of PV systems with a straightforward method to compare the cost of continuing to purchase electricity from their current provider(s) with the cost of purchasing a system and the cost of signing a PPA.

Deliverables

- A web-based application that combines the quantitative capability of the "Finance Comparison Tool"¹ with its associated user instructions contained in the "User Guide for San José Finance Tool"².

Timeline

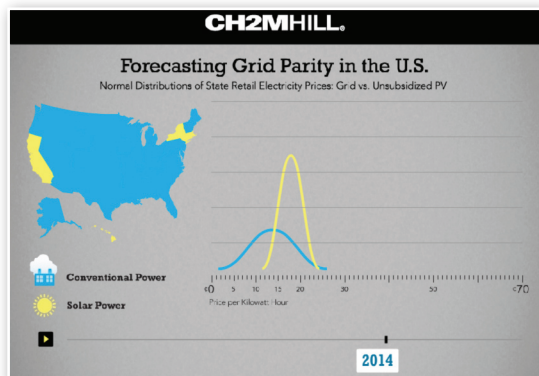
Dec. 2009 – Jan 2010	Design of web-based application
Feb. – Mar. 2010	Development of beta version of application
March 2010	Show beta version of application to DOE HQ and solicit feedback
April 2010	Focus group use of application at 3 rd Annual SACities Meeting
Apr. – July 2010	Development of public version of application
Aug. – Sept. 2010	Resolve unlimited public distribution issues
Sept. 2010	Publish application to World Wide Web

¹ Developed by Charlene Sun of the City of San José.

² Developed by Jason Coughlin of NREL.

Solar America Cities Crosscutting Project

PV Cost Convergence Model



PROJECT LEAD:

Nate Monosoff, CH2M HILL
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Project Purpose

To develop a cost convergence model for the 25 Solar America Cities to compare the convergence timing for residential and commercial solar PV rates using financial and technical variables.

The model will allow modification of a few key variables and produce a dynamic graphical display of the impact of variable changes on PV kWh price vs. conventional kWh price over time for the 25 Solar America Cities, providing valuable input for strategic planning activities.

Deliverables

- Online modeling capability and co-branded website to interact with the model based on user selected inputs. Brief technical paper/user guide.

Timeline

March 2010	Kick off Project, Collect Data w/NREL, Begin Modeling
April 2010	Continue Work, Present Preliminary Findings at SAC Annual Meeting
May 2010	Complete Modeling, Write Technical Paper, Test Website
June 2010	Launch Website

Solar America Cities Crosscutting Project

Solar Rooftop Optimization Tool

PROJECT LEAD:

Jesse Dean
jesse.dean@nrel.gov

Project Purpose

Develop an hourly solar hot water (SHW) and solar photovoltaic (PV) analysis tool that will effectively optimize the amount of roof area which should be used for SHW and PV installations on individual buildings based on the life cycle cost effectiveness of each system and the given building characteristics. As meteorological characteristics and incentives vary significantly from one region of the country to the next, it is becoming ever more important to optimize rooftops for the synergistic application of each solar technology.

Deliverables

- A web based analysis tool that is publicly available and hosted on an NREL server.
- A series of webinars disseminating information on the tool.

Timeline

April 2010	Finalize Calculation Algorithms and Internal Software Program
August 2010	Finalize Beta version of web-based program
October 2010	Develop a tutorial for the software program and finalize web-based program
Nov. 2010	Provide online webinars

Solar America Cities Crosscutting Project

Solar Ready Building Practices

PROJECT LEAD:

Andrea Watson, NREL
andrea.watson@nrel.gov

Project Purpose

Overcome incompatible buildings as a major barrier to PV by supporting Solar Ready building practices at the design stage, when solar ready modifications are low to no cost.

Deliverables

- Design and launch Solar Ready web pages on SAC public website to serve as a resource for target audience.
- Build a Solar Ready Stakeholder Advisory Board to advise on target audience, avenues of information distribution, and to support outreach effort.
- Provide sample Solar Ready ordinances for use by law making bodies interested in enacting solar ready laws.

Timeline

March 2010	Solar Ready Working Group convened
May 2010	Sample Solar Ready provision language
August 2010	Solar Ready Content integration into SAC website

Solar America Cities Crosscutting Project

Structural Design & Permitting for Solar Systems

PROJECT LEAD:

Steve Dwyer, Sandia
sfdwyer@sandia.gov

Project Purpose

Address an identified market barrier to new solar installations: structural considerations in adhering to local building codes and the construction permitting process.

Deliverables

- Letter report listing primary structural integrity and permitting issues in the SACs.
- Peer review of Madison training materials.
- Updated structural training presentation (slide deck) and accompanying manual for solar installers.
- Review draft of a “Best Practices” structural section for a solar installation guidance manual.
- Letter report on structural assessment (and proposal if applicable) for Solar ABCs.

Timeline

April 2010	Peer review of Madison materials
Sept. 2010	Revised draft of Madison Structural Guidance document Letter report identifying structural issues with solar installations
Dec. 2010	White paper discussing national structural issues applicable for new solar installations

Solar America Cities Crosscutting Project

Economic Development Study

PROJECT LEAD:

Nate Monosoff, CH2M HILL
nathan.monosoff@ch2m.com

Project Purpose

To develop an economic development report to educate and assist city and regional business recruitment and retention staff in understanding the major job generating sectors of the PV industry, setting reasonable economic development goals, and developing effective strategies.

Deliverables

- Written report outlining PV industry sectors, highlighting business drivers, and reviewing strategies to create metro area competitive advantages. Report will include review of economic development case studies and best practices, and a review of other analysis quantifying job growth potential.

Timeline

May 2010	Kick off Project, Collect Data
June 2010	Continue Work, Present Preliminary Findings at SAC Annual Meeting
July 2010	Complete Analysis, Write Report, Review, Finalize

Solar America Cities Crosscutting Project

Community Solar

PROJECT LEAD:

Jason Coughlin, NREL
jason.coughlin@nrel.gov

Project Purpose

Evaluate different financial structures that can be used to deploy community solar projects with a focus on the tax and legal implications of each one. Information will inform policy makers, utilities, and community groups and assist them make the appropriate decisions related to their community solar projects.

Deliverables

- Community Solar Financing Report
- Report providing case studies for Seattle, Madison and NYC*

Timeline

Dec. 2009	Community Solar Legal Conference Call with Stoel Rives, LLP
April 2010	Community Solar Session at SAC Annual Meeting
May 2010	Community Solar Session at DOE-sponsored Solar Boot Camp
Sept. 2010	Financial Report and Case studies completed

* NYC is planning to research community solar rather than create a project in 2010. Their findings and conclusions will be included in the case study report rather than a case study.

Solar America Cities Crosscutting Project

Solar Applications for Emergency Preparedness



PV Installation on a Fire Truck in Johnson County, Kansas

PROJECT LEAD:

David Herrmann, Critigen
michael.steinle@critigen.com

Project Purpose

To develop a guide for cities to advance the use of solar applications in emergency preparedness, response, and recovery.

Deliverables

- Final guide and strategic presentations to targeted audiences.
- **Publication:** Comprehensive Guide for Solar Applications in Emergency Preparedness to facilitate:
 - broad use of solar applications among diverse cities through identification of additional emergency preparedness applications;
 - expedited implementation of solar applications within the Solar America Cities and beyond through identification of critical technical specifications which allow more effective selection, installation, and use of solar assets;
 - demonstrated unique uses of solar applications in the critical area of emergency preparedness to support resiliency and sustainability;
 - validation of solar applications with standards and guidance for emergency preparedness through collaboration with the Department of Homeland Security (DHS).

Timeline

May 2010	Initial Draft Guide complete
June 2010	Final Guide/Presentation complete
Jun. – Oct. 2010	Presentations at targeted conferences

Solar America Cities Crosscutting Project

Solar and Historic Preservation



BIPV at historic Thoreau Center for Sustainability, San Francisco

PROJECT LEAD:

Andy Walker/Alicen Kandt, NREL
andy.walker@nrel.gov

Project Purpose

Bring solar and preservation communities together to address solar projects in historic buildings.

Deliverables

- **Publication:** “The Process of Implementing Solar Projects in Historic Buildings and Districts” covering:
 - Basic issues of historic preservation; Basic issues of solar technology;
 - Collaboration between historic preservation and solar disciplines;
 - Requirements of the National Historic Preservation Act;
 - A process to identify project candidates, engage stakeholders, observe all requirements, enforce agreements, and evaluate effects of completed projects;
 - Case studies of both successful and unsuccessful solar projects on historic buildings.

Timeline

March 2010	Research and invitations to candidates
April 2010	Recruit facilitation team, speakers
May 2010	Prepare materials, charrette venue and logistics
June 2010	Conduct charrette (2 days)
July 2010	Produce draft and final report

Solar America Cities Crosscutting Project

Solar America Cities Metrics

PROJECT LEAD:

Ty van den Akker, Critigen
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Project Purpose

Identify core metrics that are critical to measure the success of the program, establish a methodology for uniformly tracking metrics over time and obtain current metrics information.

Deliverables

- Database of metrics values for each Solar America City (and County partners).
- Report summarizing project findings and the methodology used to collect metrics values.
- PowerPoint presentation to DOE highlighting project findings.

Timeline

May 2009	Metrics defined and potential data sources identified
August 2009	Collection of Metrics begins
March 2010	Survey of local installers
April 2010	Discussion of preliminary results and data tracking best practices
May 2010	Final data and report delivery

Solar America Cities Crosscutting Project

SunCity Planning Model

PROJECT LEAD:

Beth Richards, Sandia
ehricha@sandia.gov

**The name of the project may change if it is determined that copyright or trademark issues exist with the SunCity name.*

Project Purpose

To facilitate solar adoption in U.S. cities beyond the initial 25 SACs. The tool will assist cities in the formulation and justification of solar adoption strategies. It will also enable learning about different solar adoption strategies that are available, the impacts of these adoption strategies in other cities, and the relative costs and benefit trade-offs associated with different strategies and combinations of strategies.

Deliverables

- Prototype of SunCity model/assessment tool with graphical user interface and integrated users' guide. *Initial work is focused creating a basic tool to estimate a broad range of installation potential using physical parameters, existing data on interventions covered in "Solar Powering Your Community: A Guide for Local Governments," and basic mapping of relationships between various interventions.*
- Report describing the simulation tool and data used, along with recommendations for next steps.

Timeline

Feb. 2010	Project start
May 2010	Complete conceptual model
Nov. 2010	Complete model development
Dec. 2010	Complete user interface
Jan 2011	Demonstration of prototype SunCity model/assessment tool

Workforce Development

Downstream Solar Labor Market Analysis

PROJECT LEAD:

Barry Friedman, NREL
barry.friedman@nrel.gov

Project Purpose

To assess the dynamics of labor supply and demand on a regional basis for key occupations in the U.S. solar installation industry (PV and SHC). To complete interviews with statistically valid employer sample representing 8 U.S. regions and 6-8 key occupations and industry sectors. "To better identify the number and classification of current solar industry jobs to support DOE's Solar Instructor Training Network This work will be coordinated with DOL Labor Market Initiative grantees, doing similar employer surveys and analysis.

Deliverables

- Employer database (unified)
- Employer Questionnaire with Key Metrics for JEDI Analysis and RTP Support
- Labor Supply/Demand Bibliography with URLs to Reports
- 9 Final Labor Supply/Demand Analysis Reports and slide stacks – 8 regional and 1 national

Timeline

Feb. 2010	Employer Database
March 2010	Draft Questionnaire for Review
April 2010	500 completed interviews
May 2010	1500 completed interviews
May 2010	Presentation at ASES Solar Conference
June 2010	2000 completed interviews
July 2010	Final Reports and Slide Stacks
Ongoing	Updates

Workforce Development

PV JEDI (Jobs & Economic Development Impacts) Model 2.0

PROJECT LEAD:

Barry Friedman
barry.friedman@nrel.gov

Project Purpose

To provide a tool for system developers, renewable energy advocates, government officials, decision makers and other potential users to easily identify the jobs and economic impacts associated with constructing and operating photovoltaic systems in the U.S.

PV JEDI 2.0 will incorporate the following improvements:

- the capability to estimate state-level RPS impacts over multiple years
- aggregated national impact estimates from state and proposed federal policies
- more accurate cost default inputs
- gross vs. net job impacts
- web functionality

Deliverables

- Excel spreadsheet incorporating PV JEDI improvements for public release through www.openei.org.

Timeline

June 2010	Beta PV JEDI 2.0 for SETP and internal partner review
Sept. 2010	Public Release PV JEDI 2.0

Workforce Development

Solar Workforce Scale-up: Lessons from other Countries and Industries

PROJECT LEAD:

Barry Friedman, NREL
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Project Purpose

To draw key lessons for U.S. solar workforce training, re-training, and implementation scale-up challenges from similar experiences in:

- Mature PV and SHC markets outside the U.S., e.g. Germany and Spain – placed in the U.S. context
- U.S. renewable and other high-growth, high-tech industries with characteristics similar to that of solar
- With a balance of practical data and innovation theory
- Other countries currently undertaking rapid solar WF scale-up, e.g. China and Eastern Europe

Deliverables

- Technical Report highlighting lessons learned and case studies in rapid workforce scale-up

Timeline

August 2010	Draft Report
Sept. 2010	Final Report

Workforce Development

Inventory of Solar Licensing Requirements

PROJECT LEAD:

Pat Fox, IREC
patfox@irecusa.org

Project Purpose

To provide up-to-date information regarding state licensing requirements for solar installations (PV and solar thermal) including comparative summary information as well as relevant eligibility incentive requirements.

Deliverables

- Inventory of state solar licensing requirements
- Comparative summary chart of licensing requirements

Timeline

April 2010	Draft for Review
May 2010	Released on IREC web site
May 2010	Presentation at ASES Solar Conference
Ongoing	Updates

Workforce Development

Renewable Energy Training: Best Practices & Recommended Guidelines

PROJECT LEAD:

Jane Weissman, IREC
jane@irecusa.org

Project Purpose

To update the Renewable Energy Training Best Practices document with updates on training resources, credentialing programs, and other new information.

Deliverables

- 27-page report

Timeline

Dec. 2009	Review and rewrite sections of original document
Jan 2010	Request additional reviews and comments
Feb. 2010	Prepare document for release
Feb. 2010	Post and announce release
April – May 2010	Distribute at Solar America Cities Annual Meeting & ASES Conference

Solar Project and Policy Analysis Tools

Utility Rate Open Platform Database Development

PROJECT LEAD:

Barry Friedman, NREL
barry.friedman@nrel.gov

**Project lead will ensure complementary efforts between DOE, LBNL, NREL, NRDC, and VoteSolar.*

Project Purpose

Design a Comprehensive, Collaboratively Developed Utility Rate Database.

Deliverables

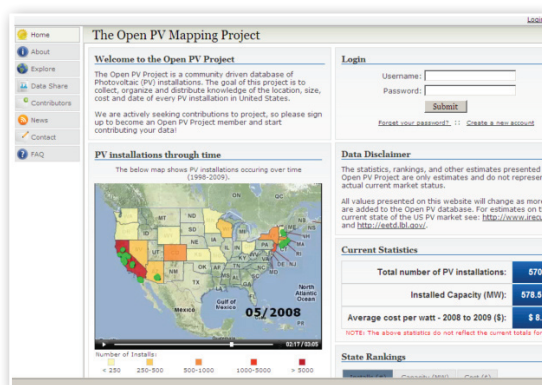
- Construct Database (develop schema, load test rate data, incorporate additional NREL rate data)
- Develop OpenEI Rates Web Form (create form, develop specialty rate calendar widget, ensure 508 compliance)
- Develop Quality Assurance Protocol (track outliers, coordinate with OpenEI quality assurance program)
- Identify and Break-down Barriers to Use (outreach to and cooperation with utilities, commissioners, NARUC)

Timeline

April 2010	Complete Database Construction (includes all test data)
May 2010	Complete Utility Rate Web Form for OpenEI
Ongoing in 2010	Monitor and Improve Quality Assurance; Establish QA Protocol
Ongoing in 2010	Work with utilities and commissioners to ensure participation

Solar Project and Policy Analysis Tools

Open PV Mapping Project: Visualization/Exploration Series



Open PV Mapping Project <http://openpv.nrel.gov/>

PROJECT LEAD:

Christopher Helm, NREL
christopher.helm@nrel.gov

Project Purpose

To develop a series of engaging visualization applications meant to present interesting features of the PV market in the US. Using the Open PV database as a starting point a new and innovative visualization application will be created once a month for four months. Each application will focus on one aspect of the US PV market and will be accompanied by an article that explore the topic in detail. This is meant to increase the visibility and usability of the Open PV database.

Deliverables

- 4 Visualization applications; 4 related “articles”; 4 related press releases.

Timeline

June – Sept. 2010 A new application, article, and press release each month

Solar Project and Policy Analysis Tools

Open PV Mapping Project: Breakeven Scenario Forecasting Tool

PROJECT LEAD:

Christopher Helm, NREL
christopher.helm@nrel.gov

Project Purpose

To develop and integrate a “breakeven scenario/forecasting tool” within the Open PV project. This tool would allow users to examine and test the sensitivities of regional PV payback periods through the adjustment of various PV parameters, such as electric rates, incentives, and installation costs. Additionally users could test “grid parity” scenarios by imposing payback lengths (in years), allowing them to optimize, or fine-tune, the various inputs to achieve PV payback on regional scales across the country.

Deliverables

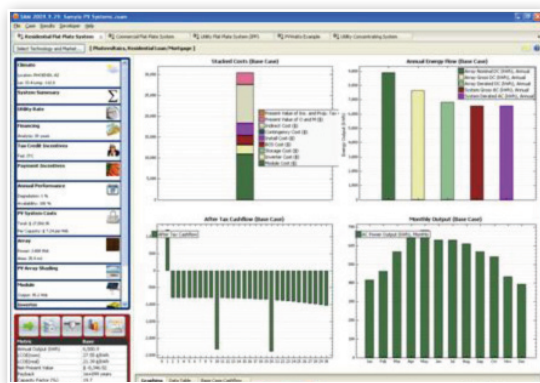
- An easy-to-use integrated visualization built on top of Open PV’s “Market Mapper”.

Timeline

June 2010	Develop official model parameters, determine requirements: input and outputs
July 2010	Begin wiring the various tools together; generate initial output maps
August 2010	Test the model with the Open PV market mapper tool
Sept. 2010	Finalize use cases, finish the user interface/ usability testing; tool delivery

Solar Project and Policy Analysis Tools

Solar Project Analysis Tool Improvements/ Dissemination



PROJECT LEAD:

Barry Friedman, NREL
barry.friedman@nrel.gov

Project Purpose

Strengthen results of SAM¹ and IMBY² via communication between tools and Utility Rate Open Platform Database (on OpenEI.org).

Solar Advisor Model (SAM)



Deliverables

- Improve SAM and IMBY tools by enabling them to draw near real-time utility rate data from OpenEI .
- Develop tools to facilitate communication between SAM desktop app and OpenEI, and between IMBY web app and OpenEI.
- Improve tool dissemination through web and event communications.

Timeline

August 2010	Complete utility rate data collection process
August 2010	Complete communication channel between SAM, IMBY, and OpenEI
Sept. 2010	Coordinate with project leads for other models to enable communication with OpenEI for improved rate data

¹ SAM: Solar Advisor Model (NREL), ² IMBY: In My Backyard (NREL)

Solar Project and Policy Analysis Tools

Solar Project How-To
Manual for Federal Sites

PROJECT LEAD:

Blaise Stoltenberg, NREL

blaise.stoltenberg@nrel.gov

Project Purpose

Collaborate with the Federal Energy Management Program (FEMP) to develop a step by step process and resource manual for Federal Site Managers to implement solar projects on their site.

Deliverables

- Manual with appendices; web version.

Timeline

March 2010	Draft Document
April 2010	Content Review by Stakeholders
May 2010	Revisions and Finalize Content and Editing
June 2010	Editing and Design
August 2010	Expected Introduction

Solar Project and Policy Analysis Tools

Renewable Energy
Project Finance
WebView

PROJECT LEAD:

Karlynn Cory, NREL

karlynn.cory@nrel.gov

Project Purpose

Create a powerful, centralized website to provide information, reports, original analysis, events and blog entries on the latest developments and innovations in RE project financing. The goal is to increase replicability of useful financing structures.

Deliverables

- Publicly available website

Timeline

Ongoing through 2010	Continue to assemble content (reports database, news, feature analysis and blogs)
Ongoing through 2010	Develop the graphic interface and refine key functionality
Dec. 2009 – Feb. 2010	Beta release (to specific/key audiences)
Jan 2010	Beta
April – May 2010	Final
April – May 2010	Public release (with media outreach)
Fall 2010	Create dynamic financing gadgets

Solar Project and Policy Analysis Tools

Feed-in Tariff Collaborative

PROJECT LEAD:

Karlynn Cory, NREL
karlynn.cory@nrel.gov

Project Purpose

Analyze broad issues with feed-in tariff (FIT) policy design and implementation in the U.S.

Deliverables

- A Policymakers Guide to Feed-in Tariff Policy Design
- Mechanisms for RE Procurement (e.g. FITs, RFPs, bilateral contracts)
- FIT History/Evolution Report (e.g. lessons learned from past success/challenges)
- Evaluation of FIT cost/price methods
- RE policies - Options for Containing Costs (e.g. FIT - caps, RPS - ACP, etc.)

Timeline

April 2010	Publication of "A Policymakers Guide to Feed-in Tariff Policy Design"
May 2010	Publication of Mechanisms for RE Procurement (e.g. FITs, RFPs, bilateral contracts)
June 2010	Publication of FIT History/Evolution Report (e.g. lessons learned from past success/challenges)
August 2010	Publication of RE policies - Options for Containing Costs (e.g. FIT - caps, RPS - ACP, etc.)

Solar ABCs

Flammability Testing of Standard Roofing Products in the Presence of Standoff-mounted PV Modules

PROJECT LEAD:

Andrew Rosenthal,
 New Mexico State University
 (through Solar ABCs)
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Project Purpose

The object of these tests was to investigate whether and how the presence of roof-mounted PV arrays may affect the fire class rating of common roof covering materials. In particular, these tests were initiated in response to questions from stakeholders about the language in the UL Guide Card that stated that PV modules may or may not reduce the fire class rating of roof coverings when modules of a lower rating are installed above a roof covering with a higher rating.

Deliverables

- Solar ABCs Interim Report describing research conducted to date and recommendations for further research.

Timeline

March 2010	Draft Report complete
April 2010	Review and approval of report by Solar ABCs Steering Committee
May 2010	Publication of Solar ABCs Report

Solar ABCs

Potential Impacts of
Advanced Metering
Infrastructure on
Renewable
Energy Policy

PROJECT LEAD:
Keith McAllister,
North Carolina Solar Center
(through Solar ABCs)
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Project Purpose

Advanced Metering Infrastructure (AMI) allows the utility to communicate with the customer, the customer to communicate with the utility and, in many cases, allows the utility to gain rapid feedback on the condition of and events occurring on its electric grid. This white paper is a primer that gives the reader an overview of AMI and also identifies possible impacts on renewable energy policy and the integration of renewable energy generation into the electric.

Deliverables

- Solar ABCs White Paper

Timeline

March 2010	Final production of white paper
April 2010	Publication of white paper

Solar ABCs

High Wind Loads
and Model Code for
PV Arrays

PROJECT LEAD:
Colleen O'Brien, BEW Engineering
(through Solar ABCs)
colleen.obrien@bewengineering.com

Project Purpose

Presently, the photovoltaic (PV) industry must rely on the various interpretations of building codes and standards by licensed structural engineers to design PV mounting systems that will withstand wind-induced loads. Custom testing methods such as wind tunnel testing or computer simulations may be used as an alternative when approved by a structural engineer. This has resulted in a multitude of code interpretations from various individuals and groups, yielding different design loads to the same design specifications.

Deliverables

- Solar ABCs Report including a recommended approach for the structural design of roof-mounted PV systems, based on the ASCE Standard 7-05 is presented. Examples are provided to demonstrate a step-by-step procedure for calculating wind loads on PV arrays.

Timeline

Feb. 2010	Draft Report complete
April 2010	Review and approval of report by Solar ABCs Steering Committee
May 2010	Publication of SolarABCs Report

Solar ABCs

Accelerated Lifetime Testing Background Research and Protocol

PROJECT LEAD:

G. Tamizh-Mani,
Arizona State University
(through Solar ABCs)
manit@asu.edu

Project Purpose

Collect and review public literature to identify the most common failure modes and mechanisms for PV modules. Identify procedures to identify the failure modes and mechanisms so that the PV modules manufacturers can implement them in their internal quality control systems. In addition to identifying test procedures, this study will attempt the development of preliminary transfer functions to correlate the accelerated lifetime testing with actual field life. This study will also define the specific data and testing needs to be collected in the next phase of this project. The study will be started in this contract and completed in a subsequent subcontract.

Deliverables

- Solar ABCs Report on public literature to identify the most common failure modes and mechanisms for PV modules.
- Solar ABCs Report with a recommended procedure for estimating multi-year PV Module Performance.

Timeline

June 2010	Background Research Report
2011	Recommended Procedure Report

Solar ABCs

PV Module Power Rating

PROJECT LEAD:

Alex Miconowicz, PowerMark
(through Solar ABCs)
acmmkr@verizon.net

Project Purpose

Recommend a New Power Rating Tolerance Standard to implement the Solar ABCs Policy that the permissible deviation from module nameplate output for current, power, and voltage for modules installed in the U.S. shall be $\pm 5\%$.

Deliverables

- Solar ABCs Report with recommended Power Rating Tolerance Standard.

Timeline

October 2010	Publication of SolarABCs Report
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Solar ABCs

Understanding the Cal Fire Solar Photovoltaic Installation Guideline

PROJECT LEAD:

Bill Brooks, Brooks Engineering
(through Solar ABCs)
bill@brooksolar.com

Project Purpose

Prepare a document to explain the California Fire Solar Photovoltaic Installation Guideline with full background.

Deliverables

- Solar ABCs Report

Timeline

July 2010	Publication of Solar ABCs Report
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Solar ABCs

State Policy Options for Valuing Distributed Solar PV Generation

PROJECT LEAD:

Kevin Fox, Keyes & Fox and IREC
(through Solar ABCs)

kfox@keyesandfox.com

Project Purpose

This report provides a comprehensive introduction to the various billing and payment options state policymakers have explored for facilitating growth in distributed generation markets, including net metering; meter aggregation, virtual net metering, and community-based programs; avoided cost payment mechanisms; other whole sale mechanisms (including feed-in tariffs and RFPs/auctions); and incentive programs.

Deliverables

- Solar ABCs Report including recommendations for policy design for each billing and payment option.

Timeline

Feb. 2010	Draft Solar ABCs Report
July 2010	Publication of Solar ABCs Report

Solar ABCs

Rate Impact of Net Metering

PROJECT LEAD:

Jason Keyes, Keyes & Fox and IREC
(through Solar ABCs)

jkeyes@keyesandfox.com

Project Purpose

This report analyzes the methodology state regulators can use to determine the rate impacts of net metered solar facilities on non-solar customer rates. Will include recommendations on factors to include in this analysis.

Deliverables

- Solar ABCs Report

Timeline

April 2010	Draft Solar ABCs Report
August 2010	Publication of Solar ABCs Report

Solar ABCs

Review of FERC's Interconnection Screens

PROJECT LEAD:

Keith McAllister,
North Carolina Solar Center
(through Solar ABCs)

keith_mcallister@ncsu.edu

Project Purpose

This report will suggest revisions to the FERC Small Generator Interconnection Procedures (SGIP) Screens. The goal of this undertaking is to gather consensus agreement among subject matter experts in the field small generator interconnections. The team will begin by identifying subject matter experts who will be surveyed in order to complete a gap analysis study. Once the gap analysis is complete, the team will work to address gaps and provide a new set of screening guides, which will be recommended by the Solar ABCs as replacements for the existing FERC SGIP screens.

Deliverables

- Solar ABCs Report

Timeline

April 2010	Draft Solar ABCs Report
August 2010	Publication of Solar ABCs Report

Solar ABCs

PV Module Frame Grounding

PROJECT LEAD:

Greg Ball, BEW Engineering and Tim Zgonena, Underwriters Laboratories
(through Solar ABCs)
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Project Purpose

A simple and practical “recipe” for equipment grounding of PV components be documented and made available to the public for the purpose of bringing clarity to this issue. Test methods will be developed for the purpose of evaluating the long-term reliability of the ground connections between metal parts in a PV array. The results will be applicable to any roof-or ground mounted PV array mounted on metal structures.

Deliverables

- Solar ABCs Report that includes defines requirements for a ground connection and identifies test methods to evaluate long-term grounding solutions.

Timeline

Sept. 2010	Draft Solar ABCs Report
2011	Publication of Solar ABCs Report

Solar ABCs

Inverter Meter Standard

PROJECT LEAD:

Jeff Newmiller, BEW Engineering
(through Solar ABCs)
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Project Purpose

This project will develop a standard procedure for certifying the accuracy of inverter-integrated AC energy metering.

Deliverables

- A draft standard that can be considered and adopted by a Standard Development Organization.

Timeline

July 2010	Draft Standard published
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